SCIENTIFIC CONVENTION

AT ALBANY.

Annual Meeting of the American Association for the Advancement of Science.

From our own Reporter.

SECOND DAY.

ALBANY, Tuesday, Aug. 19, 1851.

The length of the paper of Mr. J. W. FOSTER, yesterday, excluded any mention of the remaining papers of the day.

The first two papers in order related to the *Influence of Terrestrial Electricity on Climate* and *the Solar Light*, by Mr. D. VAUGHAN of Cincinnati. Both papers were presented by Prof. HENRY, who stated their substance. Mr. Vaughan commences with the demonstration that the great source of heat is the sun, and that all bodies derive their light and heat therefrom. He then traces a chemical action, and inquires what becomes of the light which proceeds from the sun, and which is not intercepted by the planets of our system. He holds that these portions of light must subserve some important purpose, else there must be waste.

Regarding the influence of Terrestrial Electricity on Climate, Mr. Vaughan refers certain phenomena to thermo-electric currents generated in the interior of the earth by the action of the sun. The demonstration of this theory is derived from the fact that a bar of iron, one end of which is placed in a furnace and heated, exhibits the phenomenon of currents of heat and of electricity passing each other along the bar. While the current of heat is ascending, a current of electricity is rushing down the vacuum produced by the heat, so that while a current of heat is passing along the bar, an electric current is passing along in the opposite direction. Mr. Vaughan puts forward the suggestion that similar currents are passing around the earth. Where the circuit is interrupted by the occurrence of oceans, heat is given out, and this, it is supposed, causes the increased temperature of the torrid zone.

Prof. HENRY did not see very clearly how this theory was made out. The author had some ingenious speculations, but his reasoning was not as precise as necessary in demonstrations of this character.

THE LATE ECLIPSE.

The next paper was on the Eclipse of the Sun of July 28, 1851, by Prof. PHILIP TEN EYCK of Albany. The results were announced by Prof. GEO. R. PERKINS. A simple statement of the times of observation only was made.

The observations were made at the Albany Female Academy, the latitude of which was determined on this occasion at 42° 39' 12"; longitude 73° 45' 34". The beginning of the Eclipse was 7h. 36m. 15.8 s. mean time; the end, at 9h. 19m. 15.9 s. The begining was observed by an independent second-watch; the end by a pocket chronometer. The errors of the clock were first determined by the transit of six stars.

The observations on the latitude and longitude of the Female Academy involved others on the meridian of the Capitol building, in the course of which it was found, to the surprise of every one acquainted with Albany, that the Female Academy is about 1.84 seconds *south* of the Capitol. This circumstance caused a considerable degree of discussion.

No details of the observations of the Sun on the occasion of the Eclipse were given.

The succeeding paper was by Dr. G. H. SALISBURY, Chemist of the State Agricultural Society, on the *Influence of the Poison of the Rattlesnake on Plants*. The experiments instituted gave curious and interesting results regarding the poisonous effect of the venom on the structure of plants.

Prof. AGASSIZ followed with some remarks upon the *Unconformability of the Paleozoic Formations of the United States*. These rocks, he demonstrated, follow each other in regular order on Lake Superior and in the northern part of America. He alluded to the undulations of the surface of the earth, bulgings and sinkings over extensive areas, producing such phenomena—too much neglected by geologists—as table-lands and low plains. Prof. Agassiz held to the theory of undulations instead of that of the upheaval of mountain-chains.

Mr. J. W. FOSTER remarked that this subject had not received that attention which its importance demands; and illustrated the positions assumed by Prof. Agassiz, relative to undulations of the surface, by reference to the formations of Keeweenan Point and Michigan.

Other remarks followed on the same subject, from Prof. HALL and Prof. AGASSIZ.

Prof. Agassiz was gratified to learn from so good authority as Prof. Hall and other gentlemen who had bestowed attention upon the subject of the Unconformability of the Paleozoic Rocks, that his observations on the Jura, many years since, then combated, were accurate.

Last evening, the first *soirée* was given at the residence of Gov. HUNT, on Elk-st. Nearly two hundred gentlemen were present, including the members of the Association, the officers of the army and navy now in the city, in full military dress, and several invited guests. The entertainment was an elegant affair, and is the town-talk to-day. Among the company I observed Gen. Wool. The party did not separate until a late hour, and then departed reluctantly, highly satisfied.

To-night the Chancellor of the University claims our presence, and the occasion will undoubtedly be equally satisfactory.

—Before closing, the printer and the proof-reader must come in for a notice not commendatory. The types yesterday made me talk of a "candid" instead of a *cordial* reception; of the "presence" of members, in place of their "*pleasure* and comfort." There were a number of other typographical errors of this character, which quite destroyed the sense in many places. Yours, A. M.

ALBANY, Tuesday, Aug. 19—P.M.

The Convention is filling up rapidly. Among the new arrivals to-day are Prof. Caswell of Brown University, Prof. Haldeman of Pennsylvania, Drs. John and John L. Le Conte of New-York, Dr. Le Conte of Georgia, Rev. Theodore Parker of Boston, James D. Dana, Esq., of New-Haven, Seba Smith, Esq., of New-York, Prof. Horsford of Cambridge, Prof. Bailey of West-Point, and Prof. O. M. Mitchel of Cincinnati.

The papers read at the morning session to-day were of unusual interest. I transmit abstracts of several of them.

Another and a more extended communication than that of yesterday, on the Solar Eclipse of July 28, was presented by Lieut. CHAS. H. DAVIS of Cambridge. It was as follows:

THE SOLAR ECLIPSE OF JULY 28, 1851.

Lieut. Davis reminded the Association of a communication made by him, at the meeting at New-Haven, concerning the Solar Eclipse of July 28 of this year, when he spoke of its value in determining the moon's semi-diameter and of the tables used at the office of the Nautical Almanac for determining the moon's place.

These tables, it must be remembered, were new, and never before used for an ephemeris. They were intended by Airy, in their original form, as given in the volume of lunar reductions to be an exact expression of Plana's theory, but had never been employed in practical applications. To these were added, under the immediate direction of Professor Pierce, tables embodying Stansen's long inequalities, and Airy's corrections of the principal elements of the lunar orbit and of some of the principal inequalities which he had derived from his discussion of the whole series of the Greenwich observations, together with some new terms to which this discussion led him, the existence of which had never been before suspected, although Stansen's subsequent investigations have confirmed the results thus reached by an empirical process.

It would have been very extraordinary if tables thus obtained had not proved superior to Birckhardt's old tables, which are still used in all the European Ephemerides; and the observations of the present Eclipse in this country have strikingly exemplified this superiority.

The chief difference in the results given by the two tables is in longitude; the other differences are less remarkable, and indeed of slight impotance.

The difference in longitude amounts to eighteen seconds of arc in the case of the Eclipse, and the difference in time for the phases of the Eclipse was for the beginning rather more than a minute, and for the end about two-thirds of a minute; and the whole of this great difference is in favor of the new tables, as is shown by all the observations without a single exception.

To illustrate this point, Lieut. Davis cited the beginning of the Eclipse for Cambridge.

On the very day of the Eclipse, he received from Mr. Miers Fisher Longstreth, of Philadelphia, a formula containing corrections of twelve other inequalities, with a statement that he had examined the remaining inequalities, and found that they required no correction. These corrections Mr. L. had derived also from Airy's lunar observations.

The method by which these corrections were obtained, what they are, their effect upon the theoretical computations, will probably be communicated to the Association before it adjourns. I may say, however, continued Lieut. Davis, that there was no doubt entertained from the way in which they were computed, that they would be an improvement, though the admirable agreement that followed could never have been looked for.

Mr. Davis here introduced the observations, and compared them, making comments on the results, and concluded with expressions of the strongest admiration for the sagacity and invention which had led Mr. Longstreth to his improvements of the formula of the longitude, by means of which we were now better able to predict the moon's place here than in any part of the world.

A communication on the Permeability of Metals to Mercury, read by Prof. E. N. HORSFORD, of Harvard, was an interesting paper.

THE PERMEABILITY OF METALS TO MERCURY.

By PROF. E. N. HORSFORD.

Daniel observed that bars of lead, tin, and zinc, became penetrated by mercury, when partially or wholly immersed in it. He noticed that a crystallized amalgam was formed in the case of each of the several metals. Prof. Henry modified the experiment of Daniel, in the case of lead, giving to the bar the form of a syphon, one end only of which was immersed in the mercury. He discovered the beautiful fact that mercury may not only be carried through the bar in this form, but that it will drop from the longer division of the bar, thus exhibiting the syphon experiment, employing a solid bar for the tube, and mercury for the liquid.

I met with the first exhibition of the experiment in the laboratory of Prof. Ten Eyck of this city.

I propose to give, in the following paper, the results at which I have arrived in the study of the laws of this phenomenon.

The bars employed by me, with a few exceptions for specified purposes, were cast in paper molds surrounded by sand—of a diameter varying but slightly from .666 mm., and of variable lengths to suit the objects of experiment.

I. My first object was to ascertain whether the bar, when saturated, had increased in specific gravity.

Bars of lead, after standing in a cup of mercury until they had become saturated with the latter metal, were taken out and carefully scraped to remove the surface coat, and the specific gravity determined in the usual manner.

These results were conflicting—for a reason not altogether clear to me, and I am now unable to say whether the specific gravity remains unchanged, increases or diminishes, with the addition of mercury.

The following determinations were made. They seem to indicate increased Specific Gravity.

Sp. G. of Lead.		Sp. G. of Lead and Mercury.	
11.421	Drawn bar.	11.464	cast bar.
11.405		11.409	Drawn.
11.407		11.426	
11.423	Cast bar.	11.436	
11.405		11.415	
11.387		11.420	average.
11.409	average.		

I attempted to ascertain the increased weight to see if there might be cavities in the cast bars, which, filled with mercury, would increase the total Specific Gravity. The following are the weights before and after being penetrated with mercury:

Gr. of Lead.	Increased to
I..4.6342	4.6730
II..4.8423	4.9190
III..6.2057	6.3153

Increase.
I..0.0388
II..0.0787
III..0.1102

Here was great irregularity—nearly equal quantities of lead had absorbed quantities of mercury differing from each other by a hundred per cent.

Upon examining the bars where in contact with the mercury they were corroded, lead was found dissolved in the mercury.

An analysis of the saturated lead bar by Hague, in my laboratory, gave

96.32 pr. c. of lead and of mercury.
3.63 " "
99.95

Another by Homer gave..........96.388 of lead.
Leaving..........3.622 of mercury.

II. The velocity of transmission of mercury.

It was observed by Prof. Henry, I think, that the progress of mercury in the lead was much more rapid in cast than in hammered lead.

Upon noting the progress from day to day, most unexpected results have presented themselves. In a vertical bar with the mercury at the bottom, the progress is at first rapid. It diminishes in velocity, however, from day to day, until, after months, several having reached a hight of between six and seven inches, it is not one-thousandth as rapid as at the outset.

A hollow bar of lead, of ¼ inch calibre, was erected in a cup of mercury.

The latter metal rose in 6 hours	0.062	mm.
" " " in 18 hours more	0.008	"
" " " in 12 days more	0.028	"
" " " in 8 days more	0.008	"
" " " in 11 days more	0.010	"
Total in 32 days	116	"

The mercury rose in another, in 69 days, 0.006 mm.—a little more than six inches. It continued to rise with a progress perceptible only after several days, down to July 18, when the observations ceased. This was drawn lead pipe.

In two cast bars it rose somewhat more rapidly—and to a total greater hight—thus confirming the result, already quoted from Prof. Henry. In one of them the velocities were as follows:

In 24 hours..........0.085
In 24 hours more..........0.010
In 16 days more..........0.002

III. To ascertain if this moderate elevation was influenced in any degree by gravitation—several experiments were made.

Mercury was presented at the top of a bar 0.80 m in length. Its descent was astonishingly rapid. In ten hours it had penetrated 260 mm.

The first quantity having all passed into the bar it ceased to flow. Upon the addition of another portion the flow was resumed. In less than two days the mercury dropped from the bottom. This occurred in the night and the time was not noted.

This observation is of especial importance in its bearing upon the theory of the forces which cause the movement of the mercury.

Gravitation evidently facilitates the transmission of the mercury when flowing from above downward. It, of course, opposes its flow from below upward.

To ascertain the further influence of gravity, a bar about five inches long, saturated with mercury, was withdrawn from the cup and suspended. After a time a single drop of mercury oozed from the lower end and fell. Whatever the force that held the mercury in the bar, it was not strong enough to retain all of it in opposition to gravity. I should state that from several other saturated bars of less length, similarly suspended, no mercury escaped.

IV. The mercury that drops from the bar presents a film upon its surface, which, as in a sack, of very considerable tenacity, encases the purer metal. Upon analizing the drop, Hague found by volatilizing the mercury at a low heat under a mass of cyanide of potassium, carbonate of soda and sand, 1.98 of lead, leaving 98.02 of mercury.

Repeated experiments satisfied me that these determinations gave the lead too low. The lead itself vaporizes at a much lower temperature even by itself than is generally supposed, and in the form of amalgam with mercury, at a temperature still lower. I give the result as proving merely the presence of lead in the mercury that passed through the bar of lead.

V. The presence of lead in the mercury, which was observed in the repetition of the syphon experiment, suggested the inquiry as to whether it came from the end of the bar or syphon, or from the interior as well as the end. In the latter case the interatomic spaces would be increased, and the mercury under the influence of capillary attraction and gravitation might be expected to flow faster. To ascertain if this might be, a syphon bar was arranged of diameter, .666 mm. total length not determined, but about one decimetre, or four inches. The amalgam dropped into a weighed porcelain cup, and was determined at intervals of ten days, from April 7th to July 17th, and again on July 21, emptying the cup after each weighing. The quantities that flowed through in the periods of ten days were:

1st	5.4169	6th	18.9119
2d	5.7006	7th	24.6699
3d	8.6281	8th	29.5954
4th	11.4976	9th	34.6036
5th	15.4280	10th	40.0357

Four days gave..........17.3920
For ten days to..........43.4806

There could be little doubt that the channels through the lead were increased in diameter, as the quantity of lead that flowed through in a given time was augmented by more than 800 per cent. The slightly changed condition of the end of the bar supported this conclusion.

VI. One circumstance might be conceived to modify the flow of mercury amalgam in a given time, to wit: the extent of absorbing surface exposed to the mercury.

To ascertain this two bars of equal length and diameter were taken. They were bent into syphons and the shorter legs dipped in a solution of gutta percha in chloroform—a sort of collodion, which incrusted them with an impermeable envelope. After drying, the gutta percha cuticle was scraped from the end of one bar—and from the end and a nearly equal portion of the side of the other. The shorter legs of both were placed in the same cup of mercury and the large legs in other weighed cups. Two drops fell from the bar having the larger surface before any fell from the other. After nine days the quantities were weighed. Through the bar having the greater absorbing surface there had flowed 3.5982 gr.
Through that having less..........2.1285 gr.

VII. By increasing the length of the shorter leg beyond a certain measure the syphon action ceased.

A syphon with the short leg 0.150 mm. long—the long leg 0.800 mm.—passed no amalgam, even after the whole bar had been saturated with mercury from above.

After 34 days without syphon action, the shorter leg was inclined at an angle of 15° to the horizon. Twenty days later no amalgam had dropped, and the mercury had evidently not attained the summit.

VIII. Some farther results may be of interest.

1. Two syphon bars were placed in mercury that had once run through lead—in three days drops fell from both.

2. Mercury in which lead had been standing for months, and which was viscid from the crystalized amalgam, was taken, and two bar syphons, one saturated with mercury and the other pure, were placed in it. In due time the amalgam fell from both.

3. Three syphons, of nearly equal length, were placed in a cup of mercury. In due time the amalgam cropped from all. In a few days the cup was emptied. As it ran through it was received into a second cup, from which, when the first was emptied, it was poured back, to run through a second time, and a third, and so on.

The amalgam thus run through some twelve or more times. It was saturated when it first came through, for it had every facility for acquiring the largest measure of lead it could hold. In this condition it ran repeatedly through the bars.

IX. A drawn bar saturated with mercury became brittle, as Daniel has observed. It was so brittle as to be readily broken by an effort suddenly to bend it. Such a bar, scraped brightly, and laid aside, in a few weeks lost its brittleness and peculiar texture, and recovered the properties of the original lead. It had lost its mercury by evaporation.

A cast bar, the surface of which was not scraped, after a little time lost no more of its mercury, as the following weighings evidence:

Weight.	4.9476	Difference.
20 days later	3.9871	0.0505
10 days later	3.9975	0.001
10 days later	3.9978	0.003

At first the mercury on the outside and ends was volatilized. The chrystaline amalgam prevented, thereafter, the escape of the mercury.

We have in the phenomena above detailed a class of facts which lie in the obscure border land skirting chemical affinity on one side, capillary attraction on another, gravitation on a third, and atmospheric diffusion on a fourth.

The formation of a chrystaline amalgam proves the play of chemical affinity, the more rapid flow of the amalgam downward, proves the action of gravitation, the loss of the mercury from a saturate bar, illustrates diffusion, and the continued flow of a saturate solution through a bar, and the augmented flow of mercury in successive periods employing the same bar, intimates, though it does not so clearly prove capillary attraction.

The force of diffusion is powerful enough to overcome capillary attraction and gravitation, and even chemical affinity, when the amalgam is not chrystalized.

X. I have made successful experiments to ascertain the permeability to mercury of tin, gold, silver, cadmium and zinc, and have obtained at ordinary temperature negative results, with Platinum, Palladium, iron, copper and brass. The permeability of several of the latter metals to molten tin, silver and gold, and of iron to copper, is well known.

The experiments with tin were of unanticipated interest, and although my research is not concluded, I will state one result from its bearing in another field of inquiry. Mercury penetrates tin more rapidly than lead, and exhibits the syphon action. As the bar of tin becomes saturated the whole mass begins to crystalize, and splits into irregular longitudinal fissures. If at an early stage in this chrystalization the bar is bent, the outside cracks off, revealing a pith as distinct as if it had been at first cast, and then a sheath cast around it.

If the crystallization be permitted to go on, the fissures penetrate to the center of the bar. Daniel observed, that a square bar split into triangular prisms, the separating fissures following the diagonal planes. If the top and bottom of the bar were right-angled terminal planes, the crystallization freed a pyramid at either extreme.

The bar being irregularly cylindrical, the fissures were formed as in the case of the prism—along the lines of least resistance. In looking at these fissures and the pith just referred to, and at the septaria which abound in the shales of the Genessee Valley, in Livingston County, of which numerous specimens occur in various other widely separated localities, it is impossible to resist the conviction, 1st, that the concentric arrangement in the latter case may have been produced by a process illustrated in the experiment with the tin bar, showing the interior pith, and not necessarily by aggregation, and 2d, that the fissures filled by brown carbonate of lime, giving rise, when water-worn, to the tesselated appearance of the tortoise shell have been formed by expansion along radial lines, producing openings where there was least cohesion.

A paper was also read by Dr. J. H. SALISBURY of this city, Chemist to the State Agricultural Society, giving results of analysis of the Melon.

ANALYSES OF THE MUSKMELON (*Cucumis Melo*) AND THE WATERMELON (*Cucurbita Citrullus*.)

BY J. H. SALISBURY, M. D.

The varieties examined were the Nutmeg Muskmelon, and the long red-flesh Watermelon. The fruit only was examined. Length of Muskmelon, 6 inches; diameter 5½ inches. Length of Watermelon, 14 inches; diameter 6 inches.

Per centage of Water, Dry Matter and Ash.

	Muskmelon.	Watermel.
Per centage of water	90.987	91.898
Per centage of dry matter	9.013	5.102
Per centage of ash	0.271	0.218
Per centage of ash in dry matter	3.007	4.861

The muskmelon contains but a trifle more water than the beet. The watermelon contains more than the muskmelon and less than the cucumber. One tun of the fresh fruit of the muskmelon has 174.84 lbs. of organic matter, and 5.42 lbs. of inorganic matter. One tun of watermelon fruit, fresh, contains 97.08 lbs. of organic matter, and 4.96 lbs. of inorganic matter. 36,900 lbs. of muskmelons and 40,322 lbs. of watermelons contain each 100 lbs. of inorganic matter, or ash.

	100 lbs. Ash. of Muskm'n.	100 lbs. Ash. of Waterm'n.
Carbonic acid	11.55	11.42
Silicic acid	2.20	1.21
Phosphoric acid	25.40	14.93
Sulphuric acid	3.00	1.63
Phosphate of iron	2.30	4.52
Lime	5.85	7.22
Magnesia	0.60	4.31
Potash	8.35	23.95
Soda	34.35	30.63
Chlorine	5.20	1.81
Organic matter	trace	trace
	99.70	98.73

The muskmelon contains a large per centage of phosphoric acid and soda, and considerable potash. The watermelon has a very large per centage of soda and potash, and is also quite rich in phosphoric acid. The occurrence of these bodies in such quantities in these plants, explains to us why dead animal matter, as flesh, bones, &c., common salt and ashes, have such a marked influence in promoting their growth and productiveness.

PROXIMATE ORGANIC ANALYSES OF FRUIT.

	100 lbs. Muskmelon.		100 lbs. Watermelon.	
	Fresh fruit.	Dry fruit.	Fresh fruit.	Dry fruit.
Albumen	0.918	10.219	0.572	11.403
Casein	0.442	4.952	0.004	0.080
Dextrine	1.142	12.800	0.318	6.340
Starch	trace	trace	none	none
Sugar and Extract	5.250	58.942	3.020	60.267
Chlorophyl	0.004	0.044	0.006	0.120
Fat, wax and resin	0.038	0.418	0.022	0.440
Citric acid	trace	trace	0.007	0.140
Malic acid	0.007	0.077	0.009	0.180
Tartaric acid	0.005	0.055	trace	trace
Fibre	1.123	12.393	1.058	21.030
Dry matter	8.929	100.	5.016	100.
Water	90.987		94.898	
	99.916			

The large per centage of albumen, casein, dextrine and sugar, with a small quantity of acid, shows us the reason of the peculiar rich flavor of the fruit of the Melon.

Ultimate Organic Analysis.

100 parts of dry fruit of the	Muskmelon,	Watermelon,
yield of Nitrogen	2.231	1.739
Oxygen	43.905	43.187
Carbon	44.820	43.764
Hydrogen	6.832	6.872

The Melon furnishes a mild but very pleasant liquor. For this use, the Muskmelon is much superior to the Watermelon.

The important subject of the Tides was illustrated by Prof. BACHE, superintendent of the Coast Survey, at the New-Haven meeting of the Association, and he now made a communication in addition to his former remarks, which will possess interest for navigators:

ADDITIONAL NOTES OF A DISCUSSION OF TIDAL OBSERVATION MADE IN CONNECTION WITH THE COAST SURVEY, AT CAT ISLAND, IN THE GULF OF MEXICO.

BY PROF. A. D. BACHE.

In the communication on the subject of the tides at Cat Island, Coast of Louisiana, at the New-Haven meeting of the American Association, Prof. Bache showed that he had succeeded in decomposing the curves of rise and fall, into a diurnal and semi-diurnal curve, which were nearly curves of Sines, the diurnal curve having its maximum approximately nine hours in advance of the first maximum of the semi diurnal curve, and the interference of these two waves producing the tidal wave as observed. The comparison of the curves deduced from the observations for three months, and the computed curves of sines was shown to be satisfactory. This comparison, made as before by averages of periods of a week combined into one general mean, has now been extended to the whole year with results not differing more than a quarter of an inch from observation, the mean error of which, deduced by summing the square of the Errors, is little more than one-eighth of an inch.

The curves of sines are accordingly used to determine the lengths of the diurnal and semi-diurnal waves of which the tidal wave is composed.

The present communication was intended to show how closely the numerical results obtained follow the theory of the tides, so as to furnish the basis for predictive tables from theory and observation combined.

The results were considered under two heads: the hight and time of the maximum of the diurnal wave, and the same for the semi-diurnal wave.

It is first shown that the hights of the diurnal tide vary with the moon's declination, and on the average according to the received law of the sine of twice the declination.

That they are also affected by changes of the sun's declination, varying also with twice its sine.

That they are affected by changes in the *parallax* of the moon, and vary according to the received law.

The coefficients in the formula for the hight of the tide wave were obtained by the method of least squares, and also by comparing the cases in which the sun's action was small and the moon's great, and vice versa. The results were essentially the same. The coefficients of the sun's action agrees also with that deduced from considerations connected with the semi-diurnal tide.

Tables were given of these and other results, and diagrams illustrating them geographically.

The residual from the foregoing discussion was next deduced and the results were cleaned according to the time of the moon's transit, and found to follow the law, not of the diurnal, but of the semi-diurnal wave. Taking the average result from the residuals properly arranged from 0 to 23 hours, of the moon's transit there remained very small quantities (those of positive and negative signs nearly balancing each other,) following in a general way the law of the small variation in the diurnal wave.

The cause of the existence of the residual of the form of the semi-diurnal curve was traced to the hypothesis of the difference in interval of the two waves, the residual retaining its form after certain connections resulting from the method of computation and the assumption that the maximum ordinates where those given by the formula had been small.

In the course of the discussion of the observations it was shown that the residual quantity referred to, contained no term involving the sine of twice the declination. That the action of the moon is the same when having the same declination north or south of the equator, and that changing the epoch to which the changes are referred would be without sensible effect in the result.

The conformity of the results for the semi-diurnal curve, with theory, had Prof. Bache stated exceeded his anticipations, the laws of the phenomena showing through the inequalities of the phenomena, as in the case of the times which were so irregular.

The half-monthly inequality in time and hight was shown to be deducible from the observations, following closely the law deduced from theory. The average interval corresponds to 12 h. 25 m. after the moon's transit. The interval corresponding to the moon's transit at 3 h. 30 m. and at 9 h. 30 m. is nearly the same with that found for Liverpool by Mr. Lubbock, giving a value of the constant (A) nearly the same as his. The value of the relative masses of the sun and moon thus deduced is nearly the same with that given by Mr. Lubbock, from his investigation of the tides of Liverpool and London, viz: $\frac{1}{64.66}$. The greatest and least heights correspond with the average interval, as they should do by Bernoulli's theory.

Prof. Bache stated that the computations from which the foregoing results were deduced had been severally made under his immediate direction by Linn Trowbridge, of the Corps of Engineers, Assistant in the Coast Survey, and by Messrs. Waldsworth, Gordon & Hooe, of the Coast Survey.

This afternoon, the most important paper was one by Dr. JOHN L. LE CONTE, of New-York, on the Geographical Distribution of Animals in California. This paper is the first scientific exposition of the Animal existences of that country; and, from Dr. Le Conte's known abilities, it possesses much value.

THE GEOGRAPHICAL DISTRIBUTION OF ANIMALS IN CALIFORNIA.

BY JOHN L. LE CONTE, M. D.

During a recent journey through a portion of California, my attention was called to a very remarkable kind of geographical distribution both of animals and plants which prevails in that singular portion of our country.

It is well-known that the abundance and beauty of California flowers during the early weeks of Spring is so great that the whole country appears like a highly cultivated garden; it is difficult for the traveler to believe that the elaborate arrangement of colors, which everywhere meets his eye, is the result of purely natural causes; and irresistibly the attention of even the most superficial observer is drawn toward the delicate forms of the vegetation which surrounds him. As compared with the eastern part of the continent, the greater dryness and clearness of the atmosphere have a tendency to repress the foliage of plants, while they develop in a wonderful degree the highly colored appendages which surround the generative organs.

While the attention of the traveler is thus directed to the brilliant color and peculiar form of the flowers, he will not be less conscious of a remarkable phenomenon, which greatly adds to the pleasure of traveling, and at least in the flower-season makes full amends for the absence of trees.

The flower of to-day will not be seen to-morrow—and even with the slow manner of traveling usually practiced in California, a period of two or three days is sufficient to change almost all the plants. Nor is this a change produced merely by difference of latitude or elevation. The plants of the Sierra in lat. 32°, with few exceptions, are not those of less elevated regions further north, and still less are they those of the Sierra Nevada valleys.

This being the case with the vegetation, it became important to determine if similar principles regulated the distribution of animals. With a view to ascertain this fact, particular note was taken of the localities of all reptiles and insects collected during my journey.

These collections were made principally at San Francisco, San Jose, San Diego, Vallecitas, (on the eastern slope of the Sierra,) Junction of the Colorado and Gila, and in the valley of the latter river. The data from the last-mentioned region are very imperfect, the collection having been made under peculiarly unfavorable circumstances, and during the coldest season of the year.

The mammalia and birds were less noticed, both from the fact that they had been diligently collected by previous travelers, and from a want of sufficient knowledge respecting the objects themselves. For in California more than in any other country is the naturalist obliged to rely on immediate observation; the larger objects especially, in the present condition of the country, must be neglected, as there is no possible means by which they can be preserved, or even taken care of and transported after preservation. I venture, however, from our present knowledge of the higher animals of Western America, to predict that with the exception of two sets, hereafter to be mentioned, the results will be found to agree with those derived from the study of the inferior orders.

I cannot avoid on the present occasion, expressing my sense of deep obligation to the junior officers of the Army, stationed at the Colorado and at San Diego. With scarce a single exception, the officers with whom I had the pleasure of meeting in California exhibited the most lively desire to aid my researches; not only by the frank hospitality which has connected with the most frightful deserts some of the happiest remembrances of my life, but by the full extension of all the facilities which their position could command. Thus was I enabled to visit distant and rarely accessible regions, and to pursue even minute investigations on land never before visited by a zoologist. Though the labor was mine, to them belongs the honor. For without the assistance afforded by those few individuals, who still retain under the most materializing influences their appreciation of intellectual pursuits, I feel convinced that a more than ordinary share of scientific zeal could have accomplished absolutely nothing. For this personal favor, as well as for the assistance which they will always take pleasure in extending to scientific men, I beg to offer my most heartfelt thanks.

The first fact observed by the collector is the very small number of species which can be obtained at any single locality. Day after day he meets with a continual repetition of a few common forms, with an occasional admixture of rare species, so that, at the end of two or three months, a single locality will have furnished him with about 200 species of Coleoptera, and a rather less number of other orders. It will be remembered that the contrary is true of the eastern part of the Continent, where each locality furnishes a large number of species, extending over a large area, and represented by comparatively few individuals.

On removing to another locality, the same thing is again observed, with this difference: The species of the first place, even the most abundant, are replaced by others, many of which are true representative species approaching as closely as those of Eastern America and Europe; while others belong peculiarly to their own district, and are without any representatives in the other parts of the country.

The arrangement of my collection is not yet sufficiently complete to enable me to determine the numerical proportion of species common to two or more localities, but I may safely assert that even in adjoining districts it does not exceed 7 or 8 per cent. I may likewise say that those found over a moderate extent of country usually extend over the whole, and the majority of them are either found on this side of the Rocky Mountains, or are represented by species so nearly allied that it may be doubted if they should not rather be regarded as climatic varieties.

It must be observed the localities east of the Sierra (Vallecitas, Colorado and Gila) show more resemblance in the productions than the maritime regions of California; the desert nature of the country undoubtedly produces this effect by presenting conditions unfavorable to animal life. Yet, even in this uniformly sterile tract, great differences are observed in the smaller species which abound only in moist places.

From the distribution of species, I was next led to examine into the nature of the distribution of genera and groups, expecting that similar geographical position would produce a certain resemblance to the Fauna of Europe, and thus vindicate the effects of physical causes in the organic creation.

According to a catalogue made at the time the species occurred, in the principal groups of Coleoptera, there are Carabica 170, Aquatics 70, Silphales 6, Histeridæ 30, Scarabæi 25, Malachidæ 26, Elateridæ 25, Curculionidæ 70, Longicornia 13, Chrysomalidæ 50, Tenebrionidæ 130, Staphylini 135.

The whole number of species collected amounted to a little over 1,000. The first point worthy of notice in this list is the extremely small number of Scarabæi, Elateridæ and Longicornia. This might have been predicted, as these insects derive their food for the most part from large plants. The Curculionidæ and Chrysomelinæ are not in the same proportion as in more wooded countries. The Saprophagous Coleoptera, with the exception of Histeridæ, are almost wanting, and these latter are not in larger proportion than with us. Thus the only effect so far observed, is the paucity of species in tribes for which the country affords but little food.

[Here follow some technical details, not of a popular nature.]

The only manner in which the insect Fauna of California approaches that of Europe, is in the great abundance of Apterous Tenebrionidæ. But in this respect it does not differ from a large part of South America, and by the very form of these Tenebrionidæ, which bear no resemblance at all to those of Europe, the greater relation of the California Fauna to that of the rest of America is clearly proved.

It will be seen, too, that the resemblance to European forms in the other tribes, is only indirect, proceeding solely from universal or zonal forms, while the greater relation is again with the rest of America.

It will, moreover, be seen that while the stronger relations of the Fauna is continental, yet a sufficient number of individual peculiarities are introduced to prove that it constitutes a system of its own, bearing no relation to that of Eastern America,* except the slight continental resemblance proceeding indirectly through the tropics.

Thus the comparison between the Fauna of California and that of the corresponding portion of the other continent, so far from giving any weight to the hypothesis that similar organized products, entirely demolished this view, and shows that the very diverse Fauna of different portions of the same continent are yet connected together by a strong similarity of plan.

The peculiarly local distribution of species in California may again be made use of to illustrate this position. It will be remembered that the researches of Charles Darwin have shown that the productions of the different Gallipagos Islands, though having a general resemblance to each other, are yet peculiar, each set to its own island; and that this parallelism between the islands extends through all the classes of organic beings. Prof. Gray has in a former meeting of the American Association, commenced to show that the same is true (at least of the plants) in the Sandwich Islands. And we now find a similar local distribution existing on the adjoining continent.

Now on the ocean it might be said that the islands are separated by impassable barriers of water, and that there was no opportunity for the species to migrate from one to the other. Yet the same kind of distribution has not been observed in the groups of islands connected with the other continent. And now, as if to prove the fundamental spiritual relation between the system of distribution and the part of the world in which it occurs, and its entire independence of physical causes, we find in California local zoological districts, no larger than many islands, and separated almost as sharply as if limited by impassable barriers of ocean or ice.

Thus do we see plainly the inadequacy of physical causes to account for even the distribution, much less the origin of organic beings, and we are again led irresistibly to view Nature, in all her manifestations, as the direct expression of an original and harmonious plan of God.

The principles made clear by the preceding analysis may be expressed briefly as follows:

1. California constitutes a peculiar zoological district, with sufficient relation to the other districts of America to show that it belongs to the same continental system.

2. This zoological district is divided into several sharply-defined sub-districts, having a very close resemblance to each other.

As the same mode of distribution obtains in the groups of islands adjacent to the western coast of America, we are led to believe,

3. That the local distribution of a small number of species is the characteristic of the Eastern Pacific region as the extensive distribution of a large number is the prevailing feature of the Atlantic.

4. The genera occurring in, but not peculiar to this district, belong to two classes. Either they occur on the Atlantic slope of both continents, or they are peculiar to America, and are also found within the tropics. Yours, A. M.

* I will here incidentally remark that the insect Fauna of the elevated plains of Missouri Territory apparently resembles that of California more than that of the Atlantic. This is produced by its resemblance to the Fauna of the elevated parts of Mexico, as there are scarcely any species common to the two regions, except such as extend further east. The Missouri Territory is not entitled to rank as a distinct zoological district, being only a prolongation of Central Mexico, with gradual alteration dependent on latitude, and a slight admixture from the neighboring prairies.

BALTIMORE.

Political Matters—Charge of Stealing against an Ex-Office-Holder—Serious Accident—Absquatulation—The Post-Office, &c.

Correspondence of The New-York Tribune.

BALTIMORE, Wednesday, Aug. 20, 1851—P.M.

The feud among the Opposition in reference to their recent nominations of candidates for the various offices under the new Constitution, still continues, and will be very difficult to reconcile. Their Convention meets again to-night to nominate the balance of their Legislative ticket, and unless better men are placed upon this half of the ticket than the five already chosen, it must assuredly be defeated. The Whigs hold their Ward Meetings also to-night to appoint delegates to a Convention to nominate a candidate for Congress, ten members of the Legislature, &c., and unless they do some very foolish act, (which, by the way, judging from past experience, is not improbable,) have every chance of carrying all the offices in the city, except two of the Judgeships, the Opposition candidates for which will be unanimously elected, being men of unimpeachable character. The action of the Whigs is looked to with the greatest interest by both parties—the Whigs knowing that if they bring out an unexceptionable ticket they must succeed, and the Opposition being dismayed at the bare idea of such a result. A Union ticket is much talked of, and will be urged in certain quarters, and with the "Balance of Power" party, can hold the success of either side in their hands.

A warrant was issued here this week against a man, who is charged in connection with a former high officer under John Tyler and James K. Polk, of *stealing* a carriage and two horses at Wheeling, Va., and absquatulating to parts unknown. The accused have not yet been taken—the office-holder referred to being, it is said, in Texas or California. He was one of John Tyler's original supporters in Maryland, and received a good office as a reward for his services, which he managed to retain under Polk, and was turned out by Gen. Taylor.

A very serious accident happened at the jail this morning. Mr. Dukehart, one of the Deputies, on going into the jail yard to fire off a pistol, which had been loaded for some time, fired at a swallow passing near the ground, the load (of shot) taking effect in the head of a colored man named John Brune, a prisoner charged with arson, who was at the wood pile. He is not expected to live.

A merchant, doing business for some years on Light-street wharf, disappeared on Saturday last from the city, and it has since been discovered that he took off with him about $15,000 belonging to his neighbors whom he has borrowed from, and his creditors whom he has cheated.

Our Post-Office has finally been removed to the Exchange building. The accommodations are certainly much better, but the location is very out-of-the way. Instead of being in the center, it is on one side of active business, and causes no little grumbling among our merchants up town.

Officer A. G. Ridgely, of this city, started about a week ago for Sussex county, N. J., with a requisition from Gov. Lowe on Gov. Fort of that State, for a man named Blair, *alias* Bowen, who is charged with horse and buggy stealing here. Gov. Fort gave up the prisoner, but the Sheriff of Suffolk county refused to let the officer have him, alleging that there were charges against him in that State which must first be tried. Officer Ridgely returned without him, and the question is now raised to decide whether the authority of Gov. Fort, or of the Sheriff of Sussex county, is paramount.

The Fall business has already commenced, and promises to be very active.

The weather has been intolerable to-day. Thermometer at 68 and 70, and constant rain falling. IAGO.

Advice to those who Write for the Press.

To the Editors of The New-York Tribune:

Although considerable has been said in the way of "Hints to Correspondents," &c., &c., through your paper as well as other mediums, permit a "Typo" to state a few facts concerning the duties of all who write for the Press, be it a small advertisement, a letter of correspondence, an editorial, or a book.

In the first place, all names—of county, town, place, or thing, and especially of individuals—should be written distinctly, with dots over the i's, crosses only across the t's, and a plain distinction between the u's and n's, as a compositor has no connecting sense of grammar to guide him in deciphering a name when it is obscurely written.

Secondly—when the capital letter I or J occurs in a name, (as Henry I. Jones,) make it with the pen to represent it in print, and then no mistake can occur; and where a list of names, or more than one, is written, a comma should be made after each—as Thomas Smith Walker Johnson might be made to signify one, two or four names. Any one who writes names may easily know how to punctuate them; and if he does not understand the punctuation of any other part of his manuscript, he need not fear that the printer will neglect it.

Writers for the Press should understand that compositors, as a general thing, are paid by the piece for their work, and that, if their manuscript is badly written, it is a downright robbery of their labor, as they are compelled to waste hour upon hour to put in an intelligible shape what the author has hurriedly or carelessly neglected to do. Bad grammar is little or no bother to a compositor, if the manuscript is plain; but bad grammar and bad writing combined are intolerable.

Writers who have any regard for that class of men who toil at all hours of the night to accommodate the public and earn a meager competence, should remember the above facts, and by following the instructions given, lessen the draught of bitterness consequent upon the life of a TYPO.

RULES TO BE OBSERVED IN AN EDITOR'S SANCTUM.—1. Come in at all times—what business has he to be private?

2. Take his papers with perfect freedom—what use can he have for them?

3. If you bring in a long communication, just "to fill up his paper," insist on reading and discussing it. Why shouldn't he be glad to spend an hour in listening?

4. If you see his exchanges piled up in an orderly manner on his table, seize and scatter them. What business has he to be particular?

5. If you find his chair vacant at any time, sit in it. Why should he wish to keep his stationery and scissoring from his visitors?

6. If you can't get *that* chair, though there are a dozen others in the sanctum, be sure to sit on a table and put your feet on another. If you can't practice such freedoms in an editor's room, where can you do it?

7. If you see the editor particularly engaged in writing a "leader," talk to him as industriously as you can. Will he not be gratified to hear you? Of course he will. [Benjamin Franklin.

A Proclamation.

By WASHINGTON HUNT, *Governor of the State of New-York.*

Whereas, it has been represented to me that the dwelling-house of Hiram Shaw, of the town of Berlin, in the county of Rensselaer, was forcibly entered on the 16th of August instant, in the night time, by a party of armed men, disguised as Indians, numbering about 60, and that said Shaw was violently taken from his bed and carried to the town of Stephentown in said county, where serious injuries were inflicted upon his person;

And whereas similar violations of law, fatal to public order and security, disgraceful to the character of the State and repugnant to the sentiments of all good citizens, have come to be of such frequent occurrence as to require extraordinary means to bring the offenders to justice, and to prevent the repetition of like outrages in future:

Now, therefore, in the discharge of my constitutional obligation to see that the laws are faithfully executed, I do hereby offer a reward of Five Hundred Dollars to be paid to any of the persons engaged in the commission of the said offense, who shall be the first to make a full disclosure of all the facts relating thereto, giving the names of the conspirators and exposing the particular action of each of them as far as practicable, in the seizure and abduction of said Shaw, which reward shall be paid under the direction of the Court upon the conviction of any of said offenders, and to such persons, not exceeding five, as the Court shall certify to be entitled thereto; and the persons so disclosing and testifying shall be relieved from punishment by the Executive clemency.

And I do hereby enjoin it upon all magistrates and officers of justice in the county of Rensselaer having authority and jurisdiction in the premises, to be firm and efficient in the prosecution of said conspirators, and to adopt such measures as may seem best calculated to secure their apprehension and punishment.

I would earnestly appeal to all our citizens to cooperate with the authorities in their efforts to suppress and punish these aggressions, and to uphold those principles of Law and Order, which are the only safeguards of public liberty and individual security.

I deem it my duty, moreover, to warn all combinations of persons formed for the purpose of committing lawless aggressions and personal violence, under whatever disguise or pretext, to desist from the further prosecution of designs at once perilous to themselves, abhorrent to justice, and fatal to the security and well-being of civilized society, hereby proclaiming to all whom it may concern, that the powers vested in the Executive by the Constitution will be vigorously exercised to sustain the civil authorities, vindicate the supremacy of the law, and bring its violators before the tribunals which it has erected for the protection of personal rights and the preservation of the public tranquility.

In witness whereof I have hereunto affixed my hand and the privy seal of the State, this twentieth [L. S.] day of August, in the year of our Lord one thousand eight hundred and fifty-one.

WASHINGTON HUNT.

By the Governor:
JAMES F. RUGGLES, Private Secretary.

A Predestinarian Romance.

By the clear light of the moon we could distinguished the emaciated form and features of an old Jogee. He was sparingly dressed, in the usual ochre-colored cotton clothes, and sat upon the ground with his back against the trunk of the tree. As he caught sight of us, he raised himself upon his elbow, and began to beg in the usual whining tone. "Thy gift will serve for my funeral," he said with a faint smile, pointing to a few plantain leaf platters, containing tumeric, red powder, rice, and a few other similar articles. We inquired into what he considered the signs and symptoms of approaching dissolution. It was a complaint that must have caused him intense pain, which any surgeon could have instantly alleviated. We told him what medical skill could do; offered to take him at once where assistance could be procured, and warned him that the mode of suicide which he proposed to carry out, would be one of the most agonizing description. "I consider this disease a token from the Bhagwan (the Almighty) that this form of existence is finished!" and he steadfastly refused all aid. We asked whether pain might not make him repent his decision, perhaps too late. His reply was characteristic of his caste. Pointing to a long sabre cut, which seemed the length of his right side, he remarked, "I have been a soldier, under your rule. If I feared not death in fighting at the word of the Feringe, am I likely, do you think, to shrink from it when the Deity summons me?"

It is useless to argue with these people; so we confined ourselves to inquiring what had made him leave the Company's service. He told us the old story, the cause of half the asceticism in the East, a disappointment in an *affaire de cœur*. After rising to the rank of *naick*, or corporal, very rapidly, in consequence of saving the life of an officer at the siege of Foonah, he and a comrade obtained leave of absence, and returned to their native hamlet, in the Maharatta hills. There he fell in love, desperately, as Orientals only can, with the wife of the village Brahman. A few months afterward the husband died, and it was determined by the caste brethren that the relict should follow him, by the suttee rite. The soldier, however, resolved to save her, and his comrade, apprised of his plans, promised to aid him with heart and hand. The fire was heaped up, and surrounded by a throng of gazers collected to witness the ceremony so interesting and exciting to a superstitious people. At length the suttee appeared, supported by her female relations, down the path opened to her by the awe-struck crowd. Slowly she ascended the pile of firewood, and, after distributing little gifts to those around, sat down, with the head of the deceased in her lap. At each of the four corners of the pyre was a Brahmin, chanting some holy songs. Presently the priest who stood fronting the south-east retired to fetch the sacred fire.

Suddenly a horseman, clad in yellow clothes, dashed out of a neighboring thicket. Before any had time to oppose him, his fierce little Maharatta pony clove the throng, and, almost falling upon his haunches with the effort, stood motionless by the side of the still unlit pyre. At that instant the widow, assisted by a friendly hand, rose from her seat, and was clasped in the horseman's arms. One touch of the long Maharatta spur, and the pony again bounds, plunging through the crowd, toward the place whence he came. Another moment and they will be saved. Just as the fugitives are disappearing behind the thicket, an arrow shot from the bow of a Rankari, missing its mark, pierces deep into the widow's side. The soldier buried his paramour under the tree where we were sitting. Life had no longer any charms for him. He never returned to his corps, and resolved to devote himself to futurity. It was wonderful, considering the pain he must have been enduring, to hear him relate his tale so calmly and circumstantially. The next morning, when we passed by the spot, three or four half naked figures, in the holy garb, were sitting like mourners round the body of the old Jogee. [Goa and the Blue Mountains.

POTATOES.—The rot has commenced among the potatoes in this section, and at so early a period as to excite the apprehension that it will be destructive. Many pieces, though not all we have noticed, the crops exhibit marked signs of its commencement, and in some the disease has effected the potato. The quantity planted this year is much larger than usual, and the disease must be pretty general to make potatoes very scarce in harvest time. [St. Johnsbury (Vt.) Caledonian.

ANOTHER LAND SALE AT THE SAUT.—We are happy to lay before our readers this week, the new proclamation of the President of the United States for another and very important sale of mineral and agricultural lands in the Lake Superior Land District. The sale will commence on the 27th of October next, and will embrace very extensive tracts of the most valuable mineral lands in Copperdom, and will, in fact, be the most important sale that has ever taken place in the country. [Lake Superior Jour.

☞ Josiah B. Williams, of Ithica, Henry Fitzhugh, of Oswego, and Gen. Adams, of Clyde, have been appointed by the Governor to investigate in reference to the practicability of draining the Cayuga marshes. An appropriation of $10,000 was made for this purpose, by the last Legislature. [Alb. Eve Jour.

☞ *The Providence Post* says that Martin Van Buren is as buoyant and elastic now as he was twenty years ago; and adds that "one reason perhaps is, that he has not drank intoxicating liquors in the last thirty years, and is remarkably regular in everything save his politics."